

Locust Street Bridge
Locust Street, spanning the old channel
of the Seneca River and the headrace of
the former Empire Gas and Electric
hydro-electric plant

Waterloo
Seneca County
New York

HAER No. NY-181

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PHOTOGRAPHS
WRITTEN HISTORICAL DATA

HISTORIC AMERICAN ENGINEERING RECORD

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Location: Locust Street spanning the old channel of the Seneca River and the headrace of the former Empire Gas and Electric hydro-electric plant, Village of Waterloo, Seneca County, New York. Bridge is located immediately north of Lock No. 4 of the Cayuga and Seneca Canal, 400 feet west of the Route 96 bridge, and 1,200 feet south of Routes 5 and 20.

UTM: N 4751380
E 347760
New York State Quad: Seneca Falls

Date of Construction: Plans prepared in 1912, excavation begun in 1913, arch construction during 1914, bridge opened between April and July 1915.

Style: Filled spandrel, reinforced concrete, multiple (six) arch bridge with concrete balustrades.

Engineer/Builder: This bridge was constructed as part of Cayuga and Seneca Canal improvement and enlargement "Contract E." The State of New York completed the plans for this contract in October 1912. Contract E was awarded to the Cleveland and Sons Company, Contractors, of Brockport, New York on January 7, 1913. The Central States Bridge Company, Indianapolis, Indiana fabricated the steel arch ribs under contract number 1581, dated January 24, 1914. W. H. Yates, Supervising Engineer, New York State Barge Canal, approved the fabrication plans on March 9, 1914.

Present Use and Condition: Bridge carries vehicular and pedestrian traffic, and is in fair condition.

Significance: The style of this bridge resembles the earlier stone arch crossing adjacent to this site. The probable reason for constructing a six arch reinforced concrete bridge was to use the bridge piers as buttresses for the adjoining six gate retention dam. This bridge is distinct from the hundreds of steel truss spans erected to cross the enlarged Erie, Champlain, and Cayuga and Seneca Canals.

Materials of
Construction:

Six concrete arch spans reinforced using the "Melan" system of longitudinal reinforcement at the intrados and extrados connected vertically and laterally. In plan, the bridge has four arch ribs, three spaced eight feet apart center to center under the roadway section and one under the sidewalk. In the three ribs beneath the roadway, each rib has a pair of longitudinal reinforcement bars at the intrados and at the extrados, spaced 2 feet 6 inches apart horizontally, forming a concrete rib three feet wide. Beneath the sidewalk is an upper and lower pair of longitudinal reinforcement bars spaced 1 foot 6 inches apart horizontally, forming a concrete rib two feet wide. The centerline of this arch rib is 5 feet 6 inches from the center of the adjacent roadway arch rib. At the crown of the arch the concrete rib is 1 foot 2 inches thick and approximately 10 inches separates the reinforcement of the intrados and extrados. At the skewback, the two layers of reinforcement are approximately 30 inches apart. Angle iron struts connect the longitudinal reinforcement bars both vertically and laterally.

Dimensions:

Bridge has six spans, each 36 feet between the spring line of the arch, and a total length of 244 feet. Out-to-out width is 24 feet. Curb-to-curb width is 16 feet. Roadway is divided into two lanes and a single five-foot-wide sidewalk is located on the south side of the bridge. In the two exterior spans, the distance between the spring line of the arch and the intrados of the arch is 8 feet 1 inch. In the four interior spans, the distance between the spring line and the intrados is 5 feet 3 inches. The piers are 5 feet wide at the spring line of the arches.

Significant Ex-
terior Features:

The bridge is located immediately east of the retention dam for a hydro-electric plant. Retention dam consists of six Taintor gates used to maintain the water level of the canal and regulate the water flow into the headrace of the hydro-electric plant and the old channel of the Seneca River. Three gates control the flow of water to the hydro-electric plant and three gates control flow of water into old channel of the Seneca River. The bridge is unusual because of the use of the bridge piers as buttresses for the concrete piers holding the Taintor gates. The hydro-electric plant is located a few hundred feet east of the Locust Street bridge. The plant originally used the 14 foot, 6 inch fall of the water to power four 750 horsepower, 90 rpm, vertical shaft turbines, each generating 450 kilowatts of three phase, 2,300 volt electricity.

Project

Information:

The documentation of the Locust Street Bridge was prepared by the Historic American Engineering Record (HAER), National Park Service, during the summer of 1987 for the New York State Historic Bridges Recording Project. This project was sponsored by the New York State Department of Transportation and under the supervision of Eric DeLony, Chief & Principal Architect, HAER. This report was written by Andrew Cole and Charles Scott. When citing this report, please credit the Historic American Engineering Record and the authors.

The construction of the Locust Street bridge and the adjacent Taintor gate retention dam and controlling works was part of "Contract E," one of ten contracts for the improvement, relocation, and enlargement of the Cayuga and Seneca Canal. Contract E involved the construction of Lock No. 4 and approach walls, a retention dam and controlling works, the Locust Street bridge, and a guard gate, all in the Village of Waterloo. The contract was awarded to Cleveland and Sons Company, Brockport, New York, on January 7, 1913 and declared complete on October 1, 1915.

This bridge replaced a three arch stone bridge built in 1896 to carry Locust Street across the Seneca River. Work on the concrete arch Locust Street bridge began during September 1913 when a "stiff leg" derrick excavated the masonry dam east of the stone arch bridge while a new Browning shovel excavated the new bridge's north end. In October rock and earth was excavated from the site of the north abutment of the bridge using the Browning shovel and a derrick equipped with a clam shell bucket. The south abutment, pier number five, and the sill of the retention dam and regulating gates were excavated by hand. Excavation at the site was completed in November and concrete for the approach walls and north abutment was poured in November and December. The actual construction of the arches occurred during 1914. By September, the southern arches had been formed and the concrete balustrades were being built. By October, all six arches had been formed and work on the piers for the Taintor gates was in progress. During July 1915 the concrete sidewalks and curbs were laid, the bituminous road surface was applied, and the bridge was opened to traffic.

BIBLIOGRAPHY

Becker, John E. A History of the Village of Waterloo, New York. Waterloo, N.Y.: Waterloo Library and Historical Society, 1949.

"Contract E." Annual Report of the New York State Engineer and Surveyor. Albany, N.Y.: State of New York, 1913-1917.

Meade, Norman G. "Waterloo Hydro-Electric Plant." Power 43 (March 28, 1916): 429-432.

New York State Engineer and Surveyor. Barge Canal Bulletin. Albany, N.Y.: State of New York, 1913, 1915-1917.

New York State Department of Transportation, Bridge Identification Number 4435140 File, Region 3, Syracuse, New York.

Whitford, Noble E. History of the Barge Canal of New York State. Albany, N.Y.: State of New York, 1922.